NORTH PACIFIC OCEAN

By WILLIS E. HURD

The North Pacific anticyclone, as in the preceding July, continued to dominate the weather of the upper two-thirds of the eastern half of the ocean; and, as in that month, it extended far up into the Bering Sea, entirely superceding the Aleutian LOW, except on a few days, the average pressure even at St. Paul being 30.04 inches, or 0.28 inch above the normal. Only on the lower slope of the HIGH was the barometer below the average, Honolulu slightly below, and Midway Island as much as 0.12 inch below. A slight depression lay over the western part of the Gulf of Alaska, but even there the barometer was higher than the average for the month.

The accompanying table gives the principal barometric data for several island and coast stations in west longitudes.

TABLE 1.—*Averages, departures, and extremes of atmospheric pressure at sea level at indicated hours, North Pacific Ocean and adjacent waters, August, 1930*

Stations	Average pressure	Departure from normal	Highest	Date	Lowest	Date
	Inches	*Inch*	*Inches*		*Inches*	
Point Barrow [1] [2]	29.83		30.24	26th	29.50	14th.
Dutch Harbor [1] [3]	30.09	+0.19	30.46	13th	29.44	3d.
St. Paul [1] [3]	30.04	+0.28	30.44	13th	29.42	4th.
Kodiak [1] [3]	29.94	+0.09	30.36	27th	29.60	8th.
Midway Island [1] [4]	29.97	−0.12	30.16	4th [5]	29.84	15th.
Honolulu [6]	29.98	−0.03	30.08	7th	29.82	10th.
Juneau [6]	30.05	+0.03	30.30	26th	29.78	12th.
Tatoosh Island [6] [7]	30.06	+0.01	30.23	25th	29.82	14th.
San Francisco [6] [7]	29.98	+0.04	30.13	12th	29.83	31st.
San Diego [6] [7]	29.93	+0.04	30.09	12th	29.81	27th.

[1] P. m. observations only.
[2] For 29 days.
[3] For 30 days.
[4] For 28 days.
[5] And on the 6th.
[6] A. m. and p. m. observations.
[7] Corrected to 24-hour mean.

Comparatively few cyclones invaded the middle and higher latitudes of the North Pacific, along the well-traveled steamship routes, during August. Such few as did occur and occasioned winds of gale force were confined to the western half of the ocean and were partly of tropical origin. However, one of the severest gales of the month reported by one of our vessel observers, an east wind of hurricane velocity, accompanied by a barometer reading of 29 inches, was associated with a cyclone of the extra-tropics. It was encountered by the American motorship *Triumph* in latitude 42° 30′ N., longitude 172° E. On the same date other steamships experienced gales of force 9 at varying distances to the westward. On the 30th a fresh gale was reported in the vicinity of Hakodate, Japan.

Elsewhere is an account of the two typhoons of the month, by the Rev. José Coronas, S. J., of the Manila Observatory. One of the Weather Bureau's observing vessels, the *Triumph*, passed through the earlier typhoon on the 10th, experiencing a northwest gale of force 11, with a pressure of 29 inches, very close to the Nansei Islands. Another vessel, the American steamer *Sylvan Arrow*, passed through the second typhoon on the afternoon of the 19th and morning of the 20th, touching the outskirts of the central area, with a barometer of 28.80 inches, at 4 a. m. of the 20th, in 33° 45′ N., 148° 20′ E. Winds of hurricane force were encountered on both dates. On the 21st to 24th the American steamer *President Jefferson* ran into the fresh to whole gales of this cyclone between 30° and 35° N., 150° and 160° E. There are no observations of the storm farther to the eastward, but it is thus seen that the typhoon which was lost to observation of the Manila Observatory on the 18th can be carried forward from that date for at least six days.

On the 18th a whole east gale was reported in the upper tropic by the American steamer *President Monroe* at some distance south of Midway Island. The lowest barometer reading on the vessel was 29.73 inches. It would be extremely interesting to know if this gale were connected with a tropical cyclone traveling thus far to the eastward out of the beaten path of typhoons.

In the American Tropics there is evidence that a cyclone of some intensity occurred off the Mexican west coast on the 18th to 20th. The earliest reported observation of the storm comes from the American steamer *San Marcos*, which encountered a fresh southeast gale on the 18th about 100 miles south-southeast of Acapulco, followed by a whole southerly gale farther northward on the 19th. The lowest barometer reported was 29.63 inches, read on board the Japanese steamer *Toyama Maru* in 17° 24′ N., 102° 48′ W. at midnight of the 18th. The wind shifts experienced by the *San Marcos*, and also by the American steamer *Ohioan*, which encountered a gale of force 9 west of Manzanillo, point conclusively to the existence of a cyclone in these waters.

The prevailing wind at Honolulu during August was from the east, with a maximum velocity of 25 miles an hour from the same direction on the 11th.

Fog, while less continuously observed by vessels than in July, was nevertheless frequent along the central and western portions of the northern sailing routes and in the Bering Sea. Both north and south of the Aleutian Islands, and for some distance westward toward northern Japan, fog was observed on from 10 to 16 days. Along the American coast the strip of its greatest frequency, where it was reported as occurring on 13 days, lay off central California. Off Lower California it was reported on three days.

FIVE SEVERE TYPHOONS OVER THE FAR EAST IN JULY, 1930

By Rev. JOSÉ CORONAS, S. J.

[Weather Bureau, Manila, P. I.]

The past month of July was very stormy in the Far East. Prescinding from other depression or typhoon centers of less importance, we will mention here only five of them as the most important and of greatest intensity.

Formosa and China typhoon, July 9 to 17.—The first part of this typhoon is rather indefinite until 6 a. m. of the 11th when the center was shown in our weather map about 100 miles to the southeast of Basco, Batanes Islands, moving west-northwest or northwest by west. From 2 p. m. of the same day it took a decided northerly direction very near to the east of Basco, where the barometric minimum 29.35 inches (745.4 mm.) was recorded at 8 p. m. with winds from northwest. The center passed close to or over the northeastern end of Formosa in the early hours of the 13th, the barometer of Taihoku having fallen to 29.17 inches (741.0 mm.) at 5 a. m.

The steamers *Empress of Russia*, *President Jackson*, and *Tjisondari* were well under the influence of this typhoon very near the northern part of Formosa Channel.

From Formosa the typhoon moved northwestward until 6 a. m. of the 14th, when it began to move northward again along eastern China not far from the coast. On the 15th it recurved northeastward toward north-

western Korea, where it probably filled up gradually on the 17th.

The approximate positions of the center at 6 a. m. of July 11 to 16 were as follows:

July 11, 6 a. m. 123° 05′ longitude E., 19° 15′ latitude N.
July 12, 6 a. m. 122° 20′ longitude E., 21° 45′ latitude N.
July 13, 6 a. m. 121° 30′ longitude E., 25° 30′ latitude N.
July 14, 6 a. m. 119° 00′ longitude E., 27° 00′ latitude N.
July 15, 6 a. m. 117° 30′ longitude E., 33° 20′ latitude N.
July 16, 6 a. m. 122° 20′ longitude E., 40° 30′ latitude N.

The Korea typhoon, July 18 and 19.—The first part of this typhoon is also indefinite owing to lack of observations from the Pacific between Guam and the Philippines. It seems probable, however, that after moving west-northwest for some days, it recurved to north and north-northeast on the 15th about 200 miles to the east of Balintang Channel. The center was situated at 6 a. m. of the 16th about 150 miles to the south of Naha, Loochoo Islands. From that time it moved practically northward until it probably filled up on the 20th over Manchuria.

The storm was severely felt in southwestern Japan and Korea. The following information was given by the United Press:

SEOUL, KOREA, July 21.—Figures compiled here to-day showed how great was the force of the typhoon which last week devastated wide areas in Kyushiu and Korea.

The dead are officially listed as numbering 349.

Injured persons total 201 while 1,386 persons are listed as missing.

No less than 7,812 houses have been destroyed. There are 35,220 homes and buildings flooded.

It is feared that the extent of the storm damage will prove to be even greater as additional reports are received through Government channels.

Several steamships which reported themselves in distress during the typhoon have not been heard from. It is feared they may have foundered. Large numbers of vessels in the fishing fleets are listed as lost.

The steamer *Aki Maru* was very near the center in 128° 20′ longitude E. and 31° 45′ latitude N; she reported a barometric minimum as low as 27.97 inches (710.4 mm.) at 2:55 a. m. of the 18th and hurricane winds from the north and northwest quadrants.

A Luzon typhoon, July 22 and 23.—This typhoon seems to have formed very far over the Pacific near 150° longitude E, and 12° or 13° latitude N., although lack of observations between Guam and the Philippines prevent us from giving as certain the track of this typhoon until it was clearly shown on our weather map for 2 p. m. of the 21st in about 128° longitude E. and near 15° latitude N. moving west by north. The center reached Luzon and passed about 60 miles to the north of Manila during the night of July 22–23. Once in the China Sea the typhoon moved northwestward, and reached the China coast to the west of Hong Kong in the evening of the 24th.

The steamers *Silverguava*, *Tjisondari*, *Taiping*, and *Aki Maru* were much involved in this typhoon on the 23d and 24th to the west of central and northern Luzon.

The lowest barometric minimum reported by our stations was that of Baler; it was 29.32 inches (744.65 mm.) at 10 p. m. of the 22d with winds from southeast, force 8.

The approximate positions of the center at 6 a. m. of July 22 to 25 were as follows:

July 22, 6 a. m. 125° 00′ longitude E, 15° 25′ latitude N.
July 23, 6 a. m. 119° 05′ longitude E, 16° 15′ latitude N.
July 24, 6 a. m. 116° 00′ longitude E, 19° 05′ latitude N.
July 25, 6 a. m. 110° 00′ longitude E, 23° 40′ latitude N.

The Loochoos typhoon, July 24 to 29.—This severe typhoon was probably formed on the 24th to the south of the Bonins near 143° longitude E. 20° or 21° latitude N. It moved west-northwest until it reached Naha, when it took a due west direction toward China. The barometric reading at Naha at noon of the 27th was as low as 28.31 inches (719 mm.), the winds blowing with hurricane force from the north quadrant.

The U. S. S. *Barker* was well under the influence of this typhoon over the Formosa Channel on the 29th.

The approximate positions of the center at 6 a. m. of July 24 to 29 were:

July 24, 6 a. m. 143° 20′ longitude E, 20° 30′ latitude N.
July 25, 6 a. m. 137° 00′ longitude E, 22° 50′ latitude N.
July 26, 6 a. m. 131° 30′ longitude E, 24° 15′ latitude N.
July 27, 6 a. m. 127° 45′ longitude E, 25° 35′ latitude N.
July 28, 6 a. m. 123° 15′ longitude E, 25° 55′ latitude N.
July 29, 6 a. m. 118° 50′ longitude E, 26° 00′ latitude N.

A very distant Pacific typhoon, July 24 to 30.—This typhoon was of no importance for the Philippines. It probably formed on the 24th to the east of Guam, and on the 25th and 26th it recurved gradually to the north and northeast. The center passed not far east of the Bonins in the afternoon of the 29th.

TWO SEVERE TYPHOONS OVER THE PACIFIC IN AUGUST, 1930

By Rev. José CORONAS, S. J.

[Weather Bureau, Manila, P. I.]

There has been no typhoon over the Philippines during this month of August. And even over the Pacific there have been only two very severe typhoons. One over the Loochoos and southwestern Japan and another over the Bonins.

The typhoon of the Loochoos and southwestern Japan; August 5 to 14.—The place of origin of this typhoon is still uncertain owing to lack of sufficient observations up to the present. The center seems to have remained almost stationary on the 5th and the morning of the 6th to the north-northwest of Guam in about 144° longitude E and 15° latitude N. After 2 p. m. of the 6th and during the 7th and 8th it moved northwest by west; on the 9th it inclined decidedly to the north; on the 10th to 13th it kept an almost due north direction; finally it recurved northeastward on the 13th in the neighborhood of Korea. The lowest barometric reading reported was 28.27 inches (718 mm.) at 6 a. m. of the 11th from the station of Oshima in the northern part of the Loochoo Islands.

The approximate positions of the center at 6 a. m. of August 5th and 6th, 7th, 8th, 9th, 10th, 11th, 12th and 14th are as follows; the position at 6 a. m. of the 13th is omitted as somewhat doubtful owing to lack of observations:

August 5 and 6, 6 a. m. 143° 55′ longitude E, 15° 10′ latitude N.
August 7, 6 a. m. 140° 15′ longitude E, 17° 45′ latitude N.
August 8, 6 a. m. 136° 05′ longitude E, 20° 30′ latitude N.
August 9, 6 a. m. 130° 50′ longitude E, 24° 30′ latitude N.
August 10, 6 a. m. 129° 30′ longitude E, 26° 35′ latitude N.
August 11, 6 a. m. 129° 30′ longitude E, 28° 35′ latitude N.
August 12, 6 a. m. 129° 30′ longitude E, 31° 20′ latitude N.
August 14, 6 a. m. 132° 20′ longitude E, 41° 15′ latitude N.

The Bonins typhoon, August 16 to 18.—Lack of sufficient weather reports prevents us from giving the track of this typhoon prior to the 16th. At 6 a. m. of the 16th the center of a severe typhoon was shown in our weather map to the southwest of the Bonins in about 23° latitude N., between 137° and 138° longitude E. It moved northeast on the 16th, and north-northeast on the 17th passing close to the Bonin Islands in the morning of the 17th, the barometric reading there at 6 a. m. having been